CRUMB RUBBER SAMPLING PLAN - MANUFACTURING SITE

1 SAMPLE COLLECTION

1.1 Background

The California Office of Environmental Health Hazard Assessment (OEHHA) is conducting a study of the potential health effects associated with the use of synthetic turf and playground mats containing recycled waste tires (also known as crumb rubber). The study will focus on identifying and quantifying chemicals that may be released from synthetic turf from indoor and outdoor fields throughout California. The study will estimate exposure to the chemicals and evaluate potential health hazards to users of the fields. It will also explore the feasibility of a future biomonitoring or personal monitoring study of exposure to chemicals that may be released from synthetic turf and playground mats.

In the early phase of the study, OEHHA plans to obtain new (uninstalled) crumb rubber from manufacturers that supply the material to the California synthetic turf market. The new crumb rubber will be used to develop protocols for extraction, sample treatment, and chemical analysis of in-field (installed) samples obtained in the later phase of the study. This document describes OEHHA's plan to collect, composite, and store the new crumb rubber sampled from the manufacturers.

1.2 Sample Collection Locations

The proposed crumb rubber manufacturer sample collection locations are presented in Table 1-1, and the sample collection schedule is summarized in Table 1-2.

Ex. 3 [CERCLA section 104(e)(7)(42 USC 9604(e)(7)))]

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Table 1-2 Crumb Rubber Manufacturing Site Sampling Schedule

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1.2.1 Bulk Crumb Rubber Sampling

The Crumb Rubber Manufacturing Site Sampling Plan will be implemented in general accordance with the guidelines of the US Environmental Protection Agency (US EPA), as detailed in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (EPA Publication SW-846).

Based on review of US EPA protocols[2], the following sampling plan is proposed:

- Crumb rubber manufacturer samples (mesh size 10 - 20) will be collected at two major crumb rubber manufacturing facilities in California.
- At each facility, an approximately 5 kg sample will be collected using one of the following approaches:
    - 10 crumb rubber samples (approximately 0.5 kg each) collected from each randomly selected storage bin
    - for facilities with five or more production lines - approximately equal amount of crumb rubber collected from 5 to 10 randomly selected production lines
    - for facilities with less than five production lines - approximately equal amount of crumb rubber collected from all the production lines
- At each facility, an approximately 5 kg sample will be collected for each crumb rubber grinding process, ambient and cryogenic, that the facility produced.

[2] US EPA. Revision 8, July 2014. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Publication* SW-846). Retrieved from: http://www.epa.gov/osw/hazard/testmethods/sw846/index.htm

1.2.2 Field Blanks Preparation

A field blank is a quality control measure used to identify potential contamination that may have occurred during crumb rubber sampling at a manufacturing facility and during the sample shipment to the analytical laboratory. A field blank can be prepared by opening and closing a sample container at a manufacturing facility. OEHHA plans to prepare two field blanks, one at each of the manufacturing facility specified in Table 1-1. The field blanks will be handled under the same protocol for the crumb rubber samples, as described in this sampling plan.

1.2.3 Trip Blanks Preparation

A trip blank is a quality control measure used to evaluate any potential contamination as a result of shipping and handling of samples. A trip blank can be prepared by sealing a clean sampling container and carrying it to facility sampling site. The blank container will not be opened and will accompany the sampling containers during the sampling and in the shipment to the laboratory. OEHHA plans to prepare two trip blanks, one for each manufacturing facility. The trip blanks will be handled under the same protocol for the crumb rubber samples, as described in this sampling plan.

1.3 Crumb Rubber Sample Collection

1.3.1 Sampling Procedures

Laboratory certified pre-cleaned sampling amber glass containers (wide mouth liter size) will be used to collect the crumb rubber samples and blanks. Single-use/disposable plastic sampling scoops will be used to gather crumb rubber from the storage bins or production lines. Crumb rubber samples of a particular size category from a single manufacturing facility will be placed into liter size amber glass containers. When a total of approximately 5 kg of crumb rubber is collected, the sample containers (crumb rubber samples and field blanks) will be closed with fluoropolymer resin-lined polypropylene caps and tightly sealed with paraffin. Each container will be labelled with an individual sample number, size category of the crumb rubber, date and time of collection, facility sample collected, and initials of the sample collector (Figure 1). Each sealed sample container will be placed into a plastic bag, sealed, bubble wrapped, and shipped to the laboratory in a cooler (under ambient temperature). Upon arrival at the laboratory, the samples and the field blanks will be stored in a refrigerator (at 4°C) until the laboratory is ready to process the samples. The sample handling and shipping will follow the chain-of-custody (COC) protocol specified in this sampling plan (Section 1.3.2). Sampling methods will conform to US EPA SW-846 guidelines[2]. Any deviations from this sampling procedure will be clearly stated in the sampling log with explanations.

To generate a single composite crumb rubber sample for analytical method development, the laboratory will apply established protocol to combine and mix well the crumb rubber samples of a particular size category collected from an individual facility. The sample preparation/mixing protocol will be clearly described in the scope of work of the laboratory contract with OEHHA.

Figure 1. Sample Label

Sample Collector Initials: ____ Sample Number: _____

Sample Type: _____

Collection Location: _____

Collection Date: _____

Collection Time: _____

Sample Size Category: _____

1.3.2 Chain-of-Custody Records

Chain-of-custody (COC) records are used to document sample collection and will accompany all sample shipments to the laboratory. The COC record (Table 1-3) will identify the contents of each shipment and maintain the custodial integrity of the samples.

COC form(s) will be completed and signed by sample collectors and sample handlers and sent with the samples for each shipment. If multiple coolers are sent to a single laboratory on a single day, COC forms will be completed and sent with the samples for each cooler. Generally, a sample is considered to be in a person's custody, if it is either in the person's physical possession, in the person's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until receipt by the laboratory, the custody of the samples will be the responsibility of OEHHA.

Table 1-3. Chain-of-Custody Record **Signature:……..Date: ……**

Collection Location and Address	Sample Number	Sample Type	Sample Container	Collection Date	Collection Time	Collector Initials	Date Relinquished	Receiver Name

1.4 Sampling Locations and Procedures Variances

In the event that it may become necessary to implement minor modifications to sampling strategies presented in the work plan due to variances in conditions of the crumb rubber manufacturing facility, specific modifications that took place will be documented in the OEHHA sampling logs and the COC records.

2 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROCEDURES

The QA/QC procedures will be employed at the field and in the laboratory. The QA/QC samples collected in this sample event are field blank and trip blank samples.

2.1 Field QA/QC Procedures

Field QA/QC procedures will be implemented at the manufacturing facilities and consist of the following measures:

- Chain-of-Custody (COC) forms will be used to ensure the integrity of samples submitted to the laboratory
- A sample log will be kept by OEHHA to record sampling details including crumb rubber size specification, sampling bin/production line identification, sampling date and times, and sample identification numbers. Pages will be numbered, dated, and signed by the OEHHA field staff performing sampling and data logging.
- One field QA/QC sample and one trip blank will be collected at each facility and submitted for analysis along with the crumb rubber manufacturer samples.

2.1.1 Field Blanks

The purpose of the field blank sample is to identify any potential contamination that has occurred during crumb rubber sampling at the manufacturing facilities. A field blank sample is prepared by opening and closing a sample container after sampling at each facility. The field blank, together with the trip blanks and crumb rubber sampled, will be handled, shipped and processed in the laboratory using the sample analytical method developed for this project.

2.1.2 Trip Blanks

The purpose of the trip blank sample is to evaluate if contamination occurs in shipping and handling of samples, cross contamination (e.g. migration of volatile organic chemicals) may have occurred between collected samples, and contamination of samples during sample processing in the laboratory. Trip blanks will accompany the empty sampling containers to the sampling site at the time of sampling. The sealed trip blanks will not be opened at the sampling site and will be shipped to the laboratory in the same cooler with the field blanks and crumb rubber samples. The trip blanks will be preserved, packaged, and sealed in the same manner described for crumb rubber samples. A separate sample number will be assigned to each sample and blank and it will be submitted blind to the laboratory.